Normandy NFM Limited

NORTH FLINDERS EXPLORATION

annual report

ANNUAL REPORT FOR THE MT FREDERICK PROJECT FOR THE CALENDAR YEAR 1999

Exploration Licences covered by this report:-

EL 8301	Alpha
EL 8796	Beta
EL 8797	Gamma
EL 8804	Pointer
EL 8899	Frederick
EL 8976	Delta
EL 8977	Epsilon
EL 9015	Solo

1:250,000 SHEET REFERENCE:	TANAMI	SF52-15
1:100,000 SHEET REFERENCE:	PARGEE	4758

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- ■ NT DEPARTMENT OF MINES AND ENERGY
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DM POWER FEBRUARY 2000 Normandy RN: 50049 NFM RN: DME9932

SUMMARY

The Mt Frederick Project, located in the Tanami desert region approximately 150km -northwest of the Granites Gold Mine, currently comprises 8 exploration licences. EL's 8804, 8899 & 9015 were granted on the 29th April 1999, while EL's 8301, 8796, 8797, 8976 & 8977 were granted on the 9th September 1999. During 1999, Normandy NFM negotiated an agreement with the NT DME to provide technical reports on the Project Area for an entire field season rather than anniversary year. A submission date of the 28th February each year was established. This is the first annual report for the Mt Frederick Project covering the period to 31/12/99.

Exploration comprised surface work over areas of outcrop/subcrop as well as regolith assessment drilling.

Exploration activity over the reporting period has incorporated:

- CRC Sampling: 33 samples
- Lag Sampling: 363 samples
- RAB / Aircore Drilling: 54 holes for 2431m, 808 samples
- Gridding 89.9 line kms
- Ground Magnetics 30.1 line kms
- Petrology 19 samples

It is proposed that future work will involve the evaluation of prospect areas using surface sampling and follow up vacuum drilling. Aircore drilling will be utilised to empirically evaluate areas of deeper cover. Conceptual targets may also be tested.

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1. INTRODUCTION

This report covers the Mt Frederick Project for the period ending 31/12/99.

The Mt Frederick Project area is located north of the Tanami Road, approximately 150km north west of the Granites Gold Mine. Access to the Tenements can be gained via the Old Tanami Road or from a seismic line that runs north of the Tanami Road toward the Pargee Range. Exploration Licences 8804, 8899 & 9015 were granted to Normandy NFM on 29th April 1999 for a period of six years. Exploration Licences 8301, 8796, 8797, 8976 & 8977 were granted on 9th September 1999.

Table 1 outlines tenement details.

Table 1: Mt Frederick Project Tenement Summary

EL Number	Name	Blocks	Km²	Grant Date	Expiry Date
EL 8899	Frederick	93	299	29/04/1999	28/04/05
EL 9015	Solo	1	3	29/04/1999	28/04/05
EL 8804	Pointer	3	9	29/04/1999	28/04/05
EL 8301	Alpha	70	225	09/09/1999	08/09/05
EL 8796	Beta	17	55	09/09/1999	08/09/05
EL 8797	Gamma	3	10	09/09/1999	08/09/05
EL 8976	Delta	8	26	09/09/1999	08/09/05
EL 8977	Epsilon	1	3	09/09/1999	08/09/05
		196	**630**		

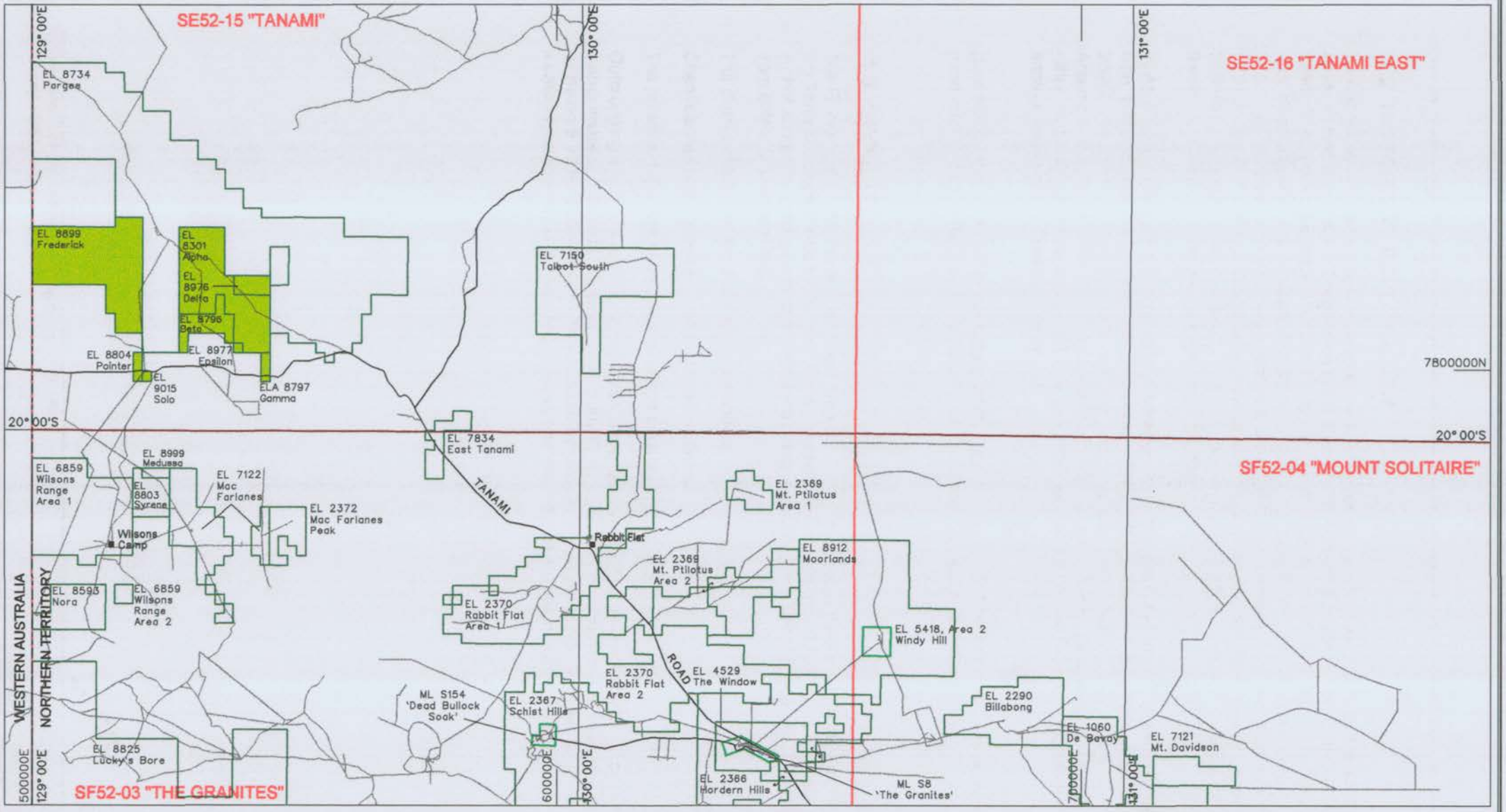
1.1 LOCATION, ACCESS AND PHYSIOGRAPHY

The Mt Frederick Project is located in the Tanami Desert region, approximately 150km NW of the Granites Gold Mine. The area is covered by the Tanami (SF52-15), 1:250 000 series map sheet, as shown on Figure 1.

Access to the Tenements can be gained via the Old Tanami Road or from a seismic line that runs north of the Tanami Road toward the Pargee Range.

Approximately 80% of the project area is dominated by various thicknesses of alluvial cover, the depth of which is greatest within either of two palaeodrainage channels transecting the Alpha and Frederick EL's. Ground water calcrete/silcrete is developed extensively on the margins of these channels. Limited areas of subcrop/outcrop are generally characterised by low, undulating rises. Prominent features include the NS-trending cherty ridges in the central region, the Pargee and Gardiner Ranges to the north of the Project Area and the Killi Killi Hills to the west of the Project area.

Sparse spinifex plains with isolated eucalypts are the typical vegetation found in the project area. Dense stands of mulga punctuate the landscape, but are usually no more than a few square kilometres in areal extent. Other vegetation includes shrubs (cassia) and low trees (mallee, tea tree and hakea). There are no permanent or perennial watercourses in the area.



N
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0 50km

SCALE 1:1,000,000

UTM Zone 52 (AGD66)

Normandy NFM Limited

NORTH FLINDERS EXPLORATION

MT FREDERICK PROJECT

TENEMENT LOCATION MAP

08/02/00

Tanami Location

FIGURE 1

...\mtfol001.dgn

1.2 HISTORICAL EXPLORATION

Limited exploration has been undertaken within the region presently occupied by the Mt Frederick Project Area. Power and Nuclear Corporation (PNC Exploration Australia) began exploring the district for uranium in 1986. They generated anomalies at outcrop sites referred to as Areas 20, 21a & 21b. Surface mapping and rock chip sampling was conducted at each site with gold anomalism up to 26 ppb reported at Areas 20 and 21b. Lag sampling at Area 21a generated a cohesive Cu-As anomaly (size and tenor unknown). RAB and DDH drilling and surface geophysical surveys were conducted at Area 20 following the discovery of a thin (0.5m to 2m) occurrence of metatorbenite and saleeite mineralisation. Very few samples were collected from these programs and even less were assayed for gold.

In April 1989 a joint venture was formed between PNC and WMC (Western Desert Joint Venture) at which time WMC began exploring primarily for gold. PNC ceased uranium exploration in the region in 1990. WMC's exploration approach involved lag sampling (-6+2mm fraction) over areas of outcrop/subcrop. Arsenic anomalism (>100ppm) was reported at Areas 21a & 21b with sample densities of 400x40m. A low order gold anomaly (max 42ppb Au) was generated at 800x100m and 200x50m lag sample spacings. This anomaly was named Coomarie Extended.

Note that for the purposes of this report, WMC Prospect Areas 21, 21a, 21b and Coomarie Extended have been renamed to the Ulyses, Hercules, Venus and Zeus Prospect Areas respectively.

1.3 GEOLOGY

The Geology of the Mt Frederick Project area consists of interpreted Palaeoproterozoic Mt Charles Beds of the Tanami Complex intruded by both felsic and mafic igneous bodies. The Mt Charles Beds have been further subdivided into a number of units by a number of Normandy-NFM Geologists. These subdivisions from oldest to youngest are:

The distal turbidites of the Blake Beds sequence;

Chemical and pelitic sediments of the Davidson Beds;

The proximal turbidites of the Madigan Beds sequence.

Outcropping lithology's at Hercules and Venus can be correlated with the chemical and pelitic metasomatically altered Davidson Beds. Early Proterozoic Pargee Sandstone overlies the Mt Charles Beds to the north of the Project Area. This is inturn overlain by Mesoproterozoic Gardiner Sandstone in various locations, specifically in the Gardiner Range, and along the margin of the Coomarie Dome.

2. WORK COMPLETED

2.1 SURVEYS

2.1.1 Gridding

A total of 89.9 line kilometres of gridding has been established (see Figure 2):

1. At each of the prospect areas earmarked for detailed surface geochemical sampling;
2. Over conceptual targets to assist the ground magnetics survey.

2.1.2 Ground Magnetics

Ground magnetics traverses (total 30.1 line kilometres) were surveyed over a number of conceptual targets during the reporting period.

Total magnetic intensity readings were recorded using a G856 Proton Precession magnetometer. Diurnal measurements were recorded using a second magnetometer as a base-station. Base readings were taken every 30 seconds. On completion of the survey, diurnal variations were removed from the data using the MAGPAC program. No modelling was carried out on the profiles. Figure 2 shows the location of the ground magnetic traverses. Appendix 2 catalogues magnetic profiles and traverse origins.

2.1.3 Petrology

23 representative samples from the Project Area were sent to Pontifex & Associates for petrological examination. Full descriptions are submitted as Appendix 3.

2.2 SURFACE SAMPLING

Lag and rock chip samples were collected within EL's 8301, 8796, 8977 and 8797. No work was conducted within EL's 8976, 8899, 9015 and 8804. Refer to Figure 2 for surficial (Lag/CRC) sample coverage within the Project Area.

Objectives of the surficial geochemical sampling program were two-fold:

1. Verify the effectiveness of WMC lag sampling and/or analytical procedures along selected lines within appropriate regolith regimes. At Hercules and Venus, 2 lines were sampled at 100m spacings. At Aphrodite, 100m spaced samples were collected along a single traverse. At Zeus, lag samples were collected at 100m spacings along 400m spaced traverses. No systematic sampling was conducted at Ulyses due to a paucity of suitable lag material.
2. Conduct regional lag sampling at reconnaissance spacings (250×500m - 1000×500m) within appropriate regolith domains.

All verification lag samples were collected along surveyed grid lines. Reconnaissance lag samples were collected using a Scoutmaster Global Positioning System (GPS) with an external aerial for navigation and lag sample location. In both cases, surface lag material was sieved to a +2mm size fraction and a 100-300g amount was double bagged and retained for multielement and low level gold analysis (see Table 4). Notes were made regarding the sample type, quality, description and grain size.

Table 2: Lag Sample Details

Tenement	Sample ID	Total Samples
Alpha (EL 8301)	3202197-234; 3202274-299; 3202301-313; 3127601-606; 3127611-616.	89
Beta (EL 8796)	3127956-976; 3202084-100; 3202119-196; 3202201-210; 3202235-273; 3127604; 3127607; 3127614; 3127617.	169
Epsilon (EL 8977)	3127976A; 3127977-8000; 3202101-118.	43
Gamma (EL 8797)	3202314-375.	62
	TOTAL	363

Table 3: CRC Sample Details

Tenement	Sample ID	Total Samples
Alpha (EL 8301)	3058192; 756148-150; 756167-169; 756171-174.	11
Beta (EL 8796)	755485-492; 787440-443; 3058193-197; 3127622-623; 756170; 756175-176.	22
Epsilon (EL 8977)		-
Gamma (EL 8797)		-
	TOTAL	33

Table 4. Laboratory, analytical code, method of analysis, and elements assayed.

SAMPLE TYPE	LABORATORY	CODE	DESCRIPTION
Lag/CRC	Genalysis	B*ETA	Aqua Regia digest with Enhanced Sensitivity Graphite Furnace Atomic Absorption Spectrometry.
		A/MS	Multi Acid digest with Inductively Coupled Plasma Mass Spectrometry.
RAB/AC	Amdel	ARM1	10-20g sample, Aqua Regia digestion, ICP-MS finish.

2.3 DRILLING

RAB & AC drilling was completed within EL's 8301, 8796, 8977 and 8797. No drilling was conducted within EL's 8976, 8899, 9015 and 8804. Refer to Figure 2 for drill hole locations.

The primary objective of the drilling program was to make a broad assessment of the regolith profile and bedrock geology. A secondary objective utilised ground magnets to target drilling across:

1. Unresolved magnetic features ;
2. Zones of sharply decreased magnetic intensity representing possible faulting /shearing or alteration associated with mineralisation;
3. Interpreted fold closures;
4. Interpreted mafic dykes;
5. Zones of interpreted significant structural disruption.

Holes were invariably drilled vertically in areas perceived to have greater than 20 metres of cover, however, holes were drilled 60^0 towards AMG east in areas proximal to outcrop. Samples were collected from 3m composite from the entire hole by spearing piles four times from different directions. Samples were sent to Amdel for multielement analysis by the ARM1 analytical technique (see Table 4 for details) and drill chips were retained for later inspection and storage.

All drill holes were plugged on completion by inserting a concrete bung approximately 1m below surface. The cavity is then back filled and mounded with the original drill spoils.

Table 5: RAB and Aircore Drill Sample Details

Tenement	Drill Hole ID	Sample ID	Total Samples
Alpha (EL 8301)	ALRB001-019	3226407-3226674.	268
	ALAC001-018	3226723-3227000.	278
Beta (EL 8796)	BETAC001-009	3226675-3226722; 446249-335.	135
Epsilon (EL 8977)	ESAC001-004	446336-446394.	59
Gamma (EL 8797)	GAAC001-004	446395-446400; 3110001-054.	60
		TOTAL	800

CR2000-0056

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NORTH FLINDERS EXPLORATION

Tanami Reconnaissance : Northern Territory

MT FREDERICK PROJECT

SAMPLE & DRILLHOLE LOCATION PLAN

Transverse Mercator Projection - UTM Zone 52
Australian Geodetic Datum - AGD66

metres
800 0 800 1600 2400 3200

SCALE 1:25000

DATA BY :	Normandy NFM	PLAN No. :	FIGURE 2
DATE :	JAN 2000	AMEND :	

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EL 8301
Alpha

EL 8734
Pargee

EL 8976
Delta

EL 8796
Beta

EL 8977
Epsilon

EL 8797
Gamma

EL 8734
Pargee

ULYSSES
(AREA 20)

AMBROSIA

HERCULES
(AREA 21a)

VENUS
(AREA 21b)

APHRODITE

MARS

ZEUS
(COOMARIE EXTENDED)

(COOMARIE EXTENDED)

SAMPLE LEGEND

- LAG, Transported, Residual
- CRC
- RAB Drillhole
- Ground Magnetics Traverse

LEGEND

- Road, Track
- Trig station, Bench mark — AH 1, BM 411
- Contour with value — 380
- Watercourse, Drain
- Lake or claypan
- Building, Bore, Yard
- Railway
- Powerline, Pipeline
- Mine
- Exploration Licence Granted, Application
- Mineral Lease
- Grid, Traverse
- Aboriginal Land, Pastural Land

GN
TN
MN
Grid / Magnetic Angle 4 °

3. RESULTS AND DISCUSSION

3.1 SURFACE SAMPLING

3.1.1 Hercules

Lag sampling at the Hercules Prospect (WMC Area 21a) highlighted an apparently stratiform arsenic anomaly (≥70ppm) with no associated gold anomalism. This result is essentially identical to that reported by WMC.

The sampling medium at Hercules is dominated by coarse, ferruginous rocky fragments and 'chert,' with minor lateritic pisoliths. The anomaly remains open to the north and to the south where lag coverage is terminated by the onlap of recent aeolian sediments.

3.1.2 Venus/Aphrodite

100m spaced lag sampling along 1.6km spaced lines at the Venus/Aphrodite Prospects (WMC Area 21b) highlighted a north-south trending arsenic anomaly (≥70ppm, max 205ppm) with a maximum gold result of 6ppb. This work effectively verifies the historical exploration coverage conducted at much denser unit spacings (400x40m).

The lag sample medium at the Venus/Aphrodite Prospects is dominated by ferruginous rocky fragments and 'chert', with minor lateritic pisoliths. The anomaly remains open to the south and to the north where suitable lag material is abundant, but also to the east on line 7810700N where the erosional surface is terminated by the recent deposition of aeolian sediments.

3.1.3 Zeus

Lag sampling along 100x400m spaced traverses at Zeus (WMC Coomarie Extended) effectively repeated historical sample data. This work highlighted a low order gold/base metal anomaly with maximum results including 42ppb Au, 98ppm As, 800ppm Ni, 290ppm Cu and 180ppm Zn.

The lag sample medium at the Zeus Prospect is dominated by laterite pisoliths developed on mafic/ultramafic lithologies, with subordinate sedimentary rock fragments. The anomaly is terminated to the east, where granitic sands predominate and to the north where the mafic host lithology is truncated by Gardiner Sandstone. The anomaly remains open to the west.

3.2 DRILLING

The drilling phase facilitated a broad assessment of the Project Area regolith and bedrock geology.

Drilling encountered extensive recent aeolian cover of variable thickness overlying Palaeoproterozoic sediments of various affinities. Transported pisoliths and ferruginous rocky fragments were found to be common at the cover/bedrock unconformity, with saprolite invariably completely weathered to greater than 70 vertical metres.

Table 6 lists the best intersections from this program. Refer to Appendix 1 for comprehensive drillhole logs and assays.

Table 6: Best RAB & Aircore Assay Intersections

Area	Drillhole ID	Intersection	Downhole Depth	Comments
Alpha (EL 8301)	ALRB001	15m @ >5ppb Au BOH	48m	f.g. sediment
	ALRB017	3m @ 17ppb Au BOH	42m	f.g. sediment
	ALRB018	6m @ > 10ppb Au BOH	30m	f.g. sediment
	ALRB019	24m @ >30ppb Au BOH	30m	m.g. sediment
	ALAC003	18m @ >40ppb Au BOH	27m	f.g. sediment
Beta (EL 8796)	BETAC008	12m @ 20ppb Au BOH	39m	m.g.-c.g. sediment
Epsilon (EL 8977)	ESAC003	33m @ >20ppb Au BOH	15m	m.g. dolerite
Gamma (EL 8797)	GAAC004	12m @ > 5ppb Au BOH	45m	f.g. sediment

REFERENCES

Blake, D.H, 1978. The Proterozoic and Palaeozoic rocks of The Granites Tanami Region, Western Australia and Northern Territory, and interregional correlations. BMR Journal of Australian Geology and Geophysics, **3**, 35-42.

Blake, D.H, Hodgson, I.M, and Muhling, P.C, 1979. Geology of The Granites – Tanami Region, Northern Territory and Western Australia. Australian Government Publishing Service, BMR Bulletin 197.

APPENDICES 1 & 2

DIGITAL DATA: Mt Frederick_99.xls (EXCEL file on CD)

Geophysics Survey Data (EXCEL file on CD)

APPENDIX 3

Petrological Sample Descriptions

Filename:	DME9932 Mt Frederick(a).doc
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Template:	D:\Current\Templates\User\Normal.dot
Title:	NORTH FLINDERS MINES LIMITED
Subject:	
Author:	Sharon
Keywords:	
Comments:	
Creation Date:	07/01/00 9:47
Change Number:	63
Last Saved On:	14/02/00 13:33
Last Saved By:	General Manager
Total Editing Time:	2,025 Minutes
Last Printed On:	14/02/00 15:22

As of Last Complete Printing

Number of Pages:	14
Number of Words:	2,523 (approx.)
Number of Characters:	14,382 (approx.)

APPENDICES 1 & 2

DIGITAL DATA: Mt Frederick_99.xls (EXCEL file on CD)

Geophysics Survey Data (EXCEL file on CD)

APPENDIX 3

Petrological Sample Descriptions

Report #	Author	Date	Work	Geo	Prospect				Notes
Petrology #	Count	ID	Type	NFMSample #	From	To	Easting	Northing	Description
Mt Frederick									
7915	**PU**	**9/10/1999 TS**		**PJD**	**Mt Frederick**				
P05185	4		O	3058195			537650	7805890	Olivine porphyritic rock
P05186	4		O	787441-443			537550	7805550	Silicified pyroxenite?
P05187	4		O	787440			537180	7805500	Partly silicified pyroxenite?
P05188	4		O				537200	7807500	Lithic , gritty, intraclast-rich, quartz-rich sandstone with planar and cross bedding
7916	**PU**	**9/10/1999 TS**		**DP**	**Mt**				
P06061	14	ALRB 001	DC	3226420	39	48	532750	7810700	Weathered chips composed largely of opaque secondary iron oxides. Minor evidence (from inclusions of quartz and clay-sericite) of quartz-poor and quartz-free rocks, possibly claystone. Also minor lithic sandstone and possible mafic (or mafic-derived sandstone)
P06062	14	ALRB 011	DC	322 055	75	81	533000	7817900	Four chips of weathered, apparently plagioclase e:.porphyritic possible andesite with altered biotite as phenocyrsts and in aggregates with other phenocrysts. Three other chips of limonite-flooded possible claystone or slate.
P06063	14	ALRB 016	DC	3226627	46	49	534[illegible]0	7819500	Apparent weathered claystone or slate, variable to sandy claystone and fine-grained sandstone with disseminated opaque oxides. All quartz-poor to quartz-free.
P06064	14	ALRB 019	DC	3226674	48	54	532740	7819500	Abundant weathered slates, aslo quartz-poor lithic to quartzo-feldspathic sandstones with minor detrital mica, accompanied by oxidised and leucoxenised opaque oxide.
P06065	14	ALAC 002	DC		57	60	530100	7815500	Unsorted lithic quartz sandstone (very coarse-grained) including clasts of acid volcanics, also quartz phenocrysts derived from acid volcanics. This volcanic detritus possibly derived from the Winnecke Formation.
P06066	14	ALAC 007	DC	3226825	30	37	529500	7821500	Unsorted lithic sandstones (medium to very coarse) including sedimentary and volcanic fragments, rare tourmaline and zircon, also rare possible granophyre
P06067	14	ALAC 010	DC	3226887	72	75	533090	7821500	Weathered quartz-poor lithic very fine grained sandstone with chlorite veins
P06068	14	532940	DC	3226960	36	42	532940	7821500	Quartz-poor lithic medium - coarse grained sandstone heavily limonitised
P06069	14	ALAC 015	DC	3226956	30	36	533206	7825230	One chip of graded siltstone-claystone (largely limonite flooded opaque). A second chip of weathered basalt with limonite after plagioclase and clays after interstitial materials, as well as disseminated leucoxene.
P06070	14	BETAC 006	DC	446272	21	24	534705	7805	One chip: breccia of claystone to very fine grained sandstone in a limonite-halloysite cement, possible supergene soil-related breccia. Second chip: quartz-rich coarse sandstone with rare lithic grains, linmitised feldspar and probalble glauconite.
P06071	14	BETAC 008	DC	446316	48	51	536350	7807500	Coarse volcaniclastic facies with quart-porphyritic clasts (lava, tuff or reworked volcanics), to lapilli size, ina fragmental host with quartz, sericite. Also irregularly dispersed limonite, locally adjacent to a quartz vein, but not clearly after sulphide or carbonate.
P06072	14	ESAC 003	DC	446377	21	24	539620	7804100	Weathered probable mafic, conceivably the equivalent of the fresh rock forming P06073

Report # / Petrology #	Author	Date	Work Count	ID	Geo Type	Prospect NFMSample #	From	To	Easting	Northing	Notes Description
P06073			14	ESAC 003	DC	446377	48	51	539620	7804100	Fresh but altered amphibolite, also weathered biotite-plagioclase rock (both with sericitised plagioclase) derived from a dolerite. Potassic alteration in one chip and a prehnite vein in another.
P06074			14	GAAC 004	DC	3110054	57	60	544400	7798000	Five chips of massive to laminated weakly metamorphosed shales with disseminated fine opaque oxide and quartz stringers. One chip of interpreted original mafic hyaloclastite which has been chloritised following intense weathering/ferruginisation.
P7877a	**PU**	**2/08/1999**	**TS**		**DP**	**Mt Frederick**					***photos***
P06055			1		DC	3127622			537944	7805311	Variously serpentine, tremolite, talc, chlorite and clay-rich altered olivine accumulative dunite and peridotite, also a single sheared tremolite-rich rock (micropyroxenite?) with rare chlorite. Some of the chips contain or consist of vein quartz +- chalcedony.
P06056			2		DC	3127625			536160	7806070	Banded carbonaceous mudstones with leucoxene and magnetite, also uralitised, epidotised and saussuritised basalt to quartz dolerite
P06057			3		DC	3127626			536180	7806050	Quartz-sericite schist with quartz-rich "pips" (metasiltstone) and quartz-sericite-leucoxene-limonite-altered plagioclase-biotite porphyritic andesite to dacite.
P06058			4		DC	3127627			537000	7804514	Claystones to siltstones, fine sericitic quartz-bearing sandstone with limonite possibly after biotite and very coarse lithic-quartz sandstone with sericite +- limonite after lithic fragments and leucoxene after opaque oxide.
P06060			5		OC	756148			530000	7823500	Vein quartz with tourmaline in layers or veins and disseminated, also oxidised opaque oxide, limonite and clays.

Petrology Report Numbers are suffixed with a, b, c etc to enable classification into project areas.
For example, the existence of Report Nos. P1234, P1234a and P1234b indicates that samples described in the report are from three distinct prospect areas.